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	COGO-ENG-MAN-002	Revision: 001	

# CoGo User Manual

## MA1 Motion Alert

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### Revision History

Revision	Date	Notes	Contributor(s)	Approver
001	2024-05-02	Initial Release	Lachlan Pedersen	Edwin Lange

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## 1. Introduction

This user guide is developed to offer industrial professionals comprehensive instructions and insights about the CoGo MA1 - Motion Alert. Through this guide, we aim to:

- **Educate:** Deliver a clear understanding of the MA1's core features, specifications, and functionalities.
- **Guide Installation:** Provide practical procedures for the straightforward installation of the sensor in industrial environments.
- **Facilitate Setup:** Detail how to configure the MA1, set temperature thresholds, and ensure its seamless communication with CoGo systems.
- **Support Troubleshooting:** Address common challenges and guide users on how to utilize diagnostic tools and logs for efficient issue resolution.

Refer to *COGO-ENG-MAN-001* for the AGW Asset Gateway.

Refer to *COGO-ENG-MAN-003* for the CoGo Cloud Portal.

This document applies to version 1.x.x of the MA1 firmware.

## 2. Product Overview

The CoGo MA1 - Motion Alert is designed as a reliable tool for the monitoring of critical assets, such as fire control valves, fire extinguishers, or confined space hatches. Offering disturbance alerts and temperature sensing capabilities, it ensures that these assets remain in their required states, providing users with timely information when changes occur.

By following this guide, industrial professionals will have the necessary knowledge to make the most out of the CoGo MA1 - Motion Alert, optimizing their asset monitoring and safety measures.


### 2.1. Part Numbers

450-00190	MA1 Movement Alert
450-00190-K1	MA1 in individual package.

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## 2.2. Specifications

**Ingress Protection:** IP67<sup>1</sup>

**Operating Temperature Range:** -40° to +55°C (-40° to +131°F)

**Dimensions:** 80 x 51 x 19 mm

**Power:** Included CR2477X Coin Cell

**Connectivity:** Bluetooth Low Energy (BLE)

**Sensitivity Range for Motion Alarms:** 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10

**Ambient Temperature Measurement Range:** -40°C to +40°C

**Ambient Temperature Measurement Accuracy:** ±2°C

**Ambient Temperature Measurement Repeatability:** ±1°C

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<sup>1</sup> IP67 rating not assessed by FM Approvals.

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### 3. Certifications and Ratings

	FM Global	FM Approved per FM 6510 standard as Class II Condition Monitoring System Certification No FM24US0035X.
	FCC	FCC ID SQGBL654
	ISED	
	CE	
	UKCA	
	MIC	R 201-180112
	RCM	R-NZ
	Bluetooth SIG	

#### 3.1. FM Approvals Conditions of Use

##### **Condition Monitoring using the MA1 and AGW Gateway**


For the purpose of accurately time-tagging events in case of a power outage, the AGW Gateways must be connected to a power source capable of providing uninterrupted service for up to one year.

For outdoor applications, AGW Gateways must be housed in an enclosure rated NEMA 4/IP65.

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## 4. Installation

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### 4.1. Securely Mount the Device:

- Identify a suitable location on the asset for mounting the MA1. Choose a spot that does not obstruct the asset's operation but is sensitive to any motion indicating a disturbance.
- Attach the MA1 using the provided fixing holes. Depending on the asset's material and design, you can use screws, zip ties, or appropriate fastening hardware. Ensure the device is firmly fixed to prevent any movement or detachment.

### 4.2. Activate the Device:

- The MA1 is shipped in shelf mode. In this mode the device uses little to no power to conserve the battery. Once mounted on the asset to monitor, the device should be transitioned into active mode.
- Locate the concealed button on the MA1. The button is within the housing at the center of the front label. Press firmly and hold this button for 3 seconds.
- Observe the green LED on the device's front panel. It should flash GREEN for 30 seconds indicating activation. This step transitions the device from shelf mode to active mode.


### 4.3. Document the Installation:

- As a recommended practice, photograph the mounted device. This visual record assists in future setup processes and serves as a reference for verifying correct installation. The photo(s) may also be added to the device in the portal for visual reference.

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## 5. Setup and Use

### 5.1. Button and LED Behaviour

Button Action	Result	LED Behaviour
<b>Short Button Press (momentary)</b>	Send a single heartbeat event. Useful for diagnostics and expedited configuration sync.	Single <b>GREEN</b> flash. (No response when in shelf mode)
<b>Medium Button Press (3 sec)</b>	Transition from shelf to active mode.	Flash <b>GREEN</b> every second for 30 seconds.
<b>Long button press (10 sec)</b>	Factory reset.	LED will turn solid <b>RED</b> after 10 seconds after which user should release the button. LED will flash <b>RED</b> a few times then reboot with default factory settings.

### 5.2. Basic Setup

Devices are managed and configured through the CoGo Portal accessible from Cogolot.com.

General set up includes the following:

- **Display Name.** This should be a name which clearly identifies the asset which the device is mounted to. In the case of an alarm, a responder should be able to locate the device based on the display name.
- **Photo(s).** At least one photo should be uploaded per device. It is recommended to upload multiple photos, especially if the device is mounted on a subcomponent of an asset or an asset in a difficult to reach location. For instance, it may be valuable to upload a photo of the outside of a sprinkler shack, the valve assembly within, as well as a closeup of the device mounted to the valve. This will assist responders in quickly locating the device in case of an alarm.
- **Location.** The Location (latitude, longitude) of the device should be set in the Portal. This allows the device to be displayed on the map and will assist in locating the device in the case of an alarm.


### 5.3. Pairing

To pair a sensor to a gateway, simply select and assign a gateway in the sensor configuration in the Portal. No physical contact is required on the devices if the sensor is within range of the gateway.

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## 5.4. Motion Alerts

The device contains an onboard accelerometer which detects when the device, and the asset which it is securely mounted to, moves. This movement indicates that the asset has been tampered with or otherwise disturbed and should be inspected to reset it to a ready state.

There are two parameters to configure motion alerts:

- **Motion Sensitivity** is a value from 1-10 which configures how sensitive a sensor is to a disturbance. At low sensitivity levels, the sensor will not alarm at minor disturbances. At higher sensitivity levels, the sensor requires less motion to trigger an alarm. The sensor should be configured to a sensitivity level at which an alarm is raised when the asset is tampered with, but not from events which should be ignored such as general facility vibrations.
- **Event Count Threshold.** In some use cases, it may be useful to utilize the event count feature to further filter out false alarms. Assets such as large sectional valves require multiple rotations to change the state of the valve. When performing these rotations, the sensor will generate many events in a short succession. Comparatively, a false alarm is typically only a single or few events. It is therefore possible to filter out these false alarms based on the *event count*. The Event Count Threshold sets the number of successive events required to trigger an alarm. If the event count is lower than this value, an alarm will not be triggered. To disable the event count filtering, simply set the event count threshold to 1.

## 5.5. Temperature Alerts

The MA1 uses an onboard temperature sensor to monitor the ambient air temperature. Low and/or high temperature alarms may be configured to alert when the temperature raises or drops beyond the set thresholds. Temperature alarms are configured via the following parameters:


- **Temperature Sense Interval.** This is the interval at which the device takes a temperature reading for both temperature monitoring and temperature alarms. A shorter temperature sense interval will provide more granular temperature detail and quicker responses to temperature alarms but will also reduce the battery life. A longer temperature sense interval will conserve the battery but may also take longer to detect an alarm state. For example, if the temperature sense interval is set to 20 minutes, it may take up to 20 minutes for a temperature alarm to be detected.
- **Enabled / Disabled.** Both high and low temperature alarms may be enabled or disabled. When disabled, the sensor will still collect temperature data according to the *temperature sense interval*, but no alarms will be raised.

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- **High/Low Temperature Alarm Threshold.** The threshold at which an alarm will be raised.

## 5.6. Temperature Monitoring

MA1 devices are intended to gather ambient temperature data regardless of if the temperature alarms are being used. This temperature data can be used to analyze environmental trends and provide insights.

- **Temperature Sense Interval** is the interval at which temperature data is collected. Shorter intervals lead to a lower battery life. The recommended default value is 30 mins.

## 5.7. Heartbeat Monitor (Battery Monitoring)

In an ideal case, an MA1 sensor will have very few, if any, alarms. The heartbeat monitor monitors the status of the MA1 and ensure it remains functional.

The sensor will send periodic events containing battery life and other health metrics to the cloud. The cloud will monitor the receipt of these events and raise an alarm if one or multiple are missed.

- **Heartbeat Interval** is the interval at which the sensor will send heartbeat events. As with the temperature sense interval, a shorter interval will create a more responsive device but also reduce battery life. The recommended default is 30 minutes.
- **Heartbeat Monitor Enabled/Disabled** turns on/off the cloud monitoring functionality. If this is disabled, battery life and connection information will still be updated in the cloud according to the heartbeat interval, but missed heartbeat alarms will not be raised.  
Note that disabling the heartbeat monitor will not affect battery life, as the MA1 will still report heartbeat events according to the heartbeat interval.

# 6. Maintenance

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The MA1 sensor does not require any periodic maintenance other than battery replacement. The battery level will be monitored by the cloud and an alert will be sent when it's time to change the battery. The battery may be purchased through CoGo or directly from a battery supplier. The battery model CR2477X manufactured by Murata Electronics must be used. Note that this is not the same as a standard CR2477 battery. The CR2477X is capable of operating at a wider temperature range.

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